

TWO NEW SPECIES OF THE ANT SUBFAMILY
LEPTANILLINAE FROM YUNNAN, CHINA*
(HYMENOPTERA: FORMICIDAE)

XU Zheng-Hui ZHANG Ji-Ling

(Faculty of Resources, Southwest Forestry College, Kunming 650224, Yunnan Province China)

Abstract Two new species of the ant subfamily Leptanillinae are discovered in the Xishan Mountain Forest Park of Kunming City, Yunnan Province, i. e. *Protanilla furcomandibula* sp. nov. and *Leptanilla kunmingensis* sp. nov. Keys based on worker caste with illustrations are provided for the 3 known species of *Protanilla* of China and the 4 known Chinese species of *Leptanilla*.

Key words Hymenoptera, Formicidae, *Protanilla*, *Leptanilla*, new species.

Worker caste of 3 genera of Leptanillinae are known in the world, i. e. *Protanilla*, *Leptanilla* and *Anomalomyrmex* (Bolton, 1990, 1994, 1995). *Protanilla* is a small genus with only 3 species described in the world. *Leptanilla* is a larger genus with more than 37 species recorded in the world (Baroni Urbani, 1977; Bolton, 1995). The Chinese species of *Protanilla* were reported by Xu (2001) and those of *Leptanilla* were reported by Tang *et al.* (1992), Ogata *et al.* (1995) and Xu (2001). In this study, 2 new species of Leptanillinae, *Protanilla furcomandibula* sp. nov. and *Leptanilla kunmingensis* sp. nov., are discovered in the Xishan Forest Park of Kunming City, Yunnan Province. Up to date, 3 species of *Protanilla* and 4 species of *Leptanilla* are known in China.

Standard measurements and indices are defined as follows:

TL: Total length-the total outstretched length of the individual, from the mandibular apex to the gastral apex.

HL: Head length-the length of the head proper, excluding the mandibles; measured in a straight line from the anterior clypeal margin to the mid-point of the occipital margin, in full-face view. In species with a strongly concave occipital margin the head length is measured to the mid-point of a line connecting the posterolateral projections.

HW: Head width-the maximum width of the head, measured in full-face view.

CI: Cephalic index = $HW \times 100 / HL$.

SL: Scape length-the straight-line length of antennal scape excluding the basal constriction.

SI: Scape index = $SL \times 100 / HW$.

PW: Pronotal width-the maximum width of the pronotum in dorsal view.

AL: Alitrunk length-the diagonal length of the alitrunk in lateral view from the point at which the pronotum meets the cervical shield to the posteroventral corner of alitrunk.

ML: Mandibular length-the straight-line length of mandible from apex to the base.

PNL: Petiolar node length-with petiolar node in lateral view, the maximum longitudinal length of the node without its anterior and posterior peduncles.

* This study is supported by the Applied and Basic Research Foundation of Yunnan Province (No. 97C006G).

Received 9 July 2001, accepted 1 Sep. 2001.

PNH: Petiolar node height-with petiolar node in lateral view, the maximum vertical height of the node from summit to lowermost part of subpetiolar process.

PNW: Petiolar node width-the maximum width of the petiolar node in dorsal view.

PPNL: Postpetiolar node length-with postpetiolar node in lateral view, the maximum longitudinal length of the node without its anterior and posterior peduncles.

PPNH: Postpetiolar node height-with postpetiolar node in lateral view, the maximum vertical height of the node from summit to lowermost part of subpostpetiolar process.

PPNW: Postpetiolar node width-the maximum width of the postpetiolar node in dorsal view. All measurements are expressed in mm.

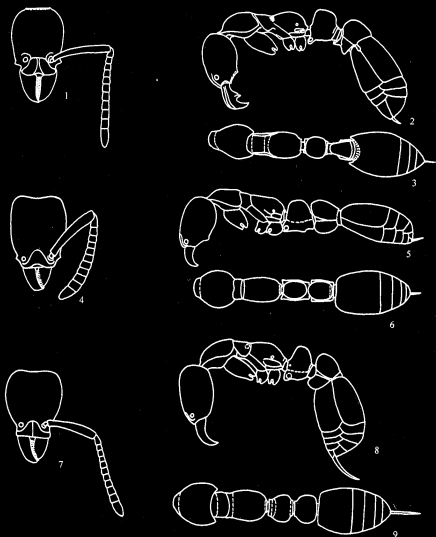
The type specimens are deposited in the Insect Collection, Southwest Forestry College, Kunming, Yunnan Province, China.

Key to Chinese species of *Protanilla* based on worker caste

1. In lateral view mandible broad, lateroventral margin with 2 teeth. Ventral margin of postpetiole concave in profile view. In dorsal view anterior border of gaster deeply concave, with anterolateral corners protruding and surrounded the postpetiole (Figs. 1-3) (China: Middle Yunnan) *P. furcomandibula* sp. nov.
2. In lateral view mandible narrow, lateroventral margin without tooth. Ventral margin of postpetiole convex in profile view. In dorsal view anterior border of gaster not concave 2
2. In full-face view head not constricted at the antennal socket position in contrary with a prominence at each side. Mandible with 11 peg-like teeth. Anterior margin of clypeus emarginate. Antennal segments 4-10 broader than long. In profile view anterodorsal corner of petiolar node as high as posterodorsal corner. In dorsal view both petiolar node and postpetiolar node are longer than broad. Body in color brownish yellow, metathorax, propodeum, petiole, postpetiole and first gastral segment black (Figs. 4-6) (China: Southern Yunnan) *P. bicolor* Xu
3. In full-face view head constricted at the antennal socket position. Mandible with 13 peg-like teeth. Anterior margin of clypeus straight. Antennal segments 4-10 as broad as long. In profile view anterodorsal corner of petiolar node higher than posterodorsal corner. In dorsal view both petiolar node and postpetiolar node are broader than long. Body in color reddish brown (Figs. 7-9) (China: Southern Yunnan) *P. concolor* Xu

Protanilla furcomandibula sp. nov. (Figs. 1-3)

Holotype worker: TL 4.1, HL 0.77, HW 0.60, CI 78, SL 0.67, SI 111, PW 0.47, AL 1.17, ML 0.50, PNL 0.33, PNH 0.43, PNW 0.32, PPNL 0.40, PPNH 0.43, PPNW 0.30. Head distinctly longer than broad, narrowed forward. In full face view, occipital margin straight, occipital corners rounded. Lateral sides of head evenly convex and with a tooth-like prominence at the antennal socket position, below the prominence with a deep notch. In dorsal view mandible long triangular, masticatory margin with 15 spine-like teeth. In lateral view mandible thick, lateroventral margin with 2 teeth, the basal one short and oblique, the apical one long and erect. Clypeus roughly triangular, anterior margin obviously concave in the center. Antenna with 12 segments, scape surpassed occipital corner by 1/5 of its length, segments 5-11 longer than broad, antennal club indistinct. In profile view, thorax distinctly constricted at mesothorax, pronotum roundly convex, mesonotum straight. Promesonotal suture distinct, metanotal groove depressed. Dorsum of propodeum evenly convex, longer than declivity, posterodorsal corner rounded. In profile view petiolar node nearly rectangular, anterodorsal corner bluntly prominent, higher than posterodorsal corner, the latter rounded, anterior face vertical, posterior face sloped, dorsal face weakly convex. Subpetiolar process long and anteroventrally pointed, with a circular subtransparent fovea. Postpetiolar node weakly inclined forward, anterior face convex, dorsal face straight, anterodorsal corner rounded. Sternite of postpetiole deeply concave on the ventral face. In dorsal view petiolar node roughly square, width: length = 9:8, anterior and posterior borders weakly convex, lateral borders evenly convex. Postpetiolar node

Figs. 1-9 *Protanilla* workers

1-3. *P. furcomandibula* sp. nov. 4-6. *P. bicolor* Xu 7-9. *P. concolor* Xu 1, 4, 7. head in full face view
2, 5, 8. body in profile view 3, 6, 9. body in dorsal view 4-9. after Xu (2001)

trapezoid, narrowed forward and longer than broad, anterior and posterior faces roundly convex, lateral sides straight. In profile view, anterior margin of gaster with a narrow deep notch between tergite and sternite of the first segment. In dorsal view, anterior margin of gaster deeply concave, with anterolateral corners protruding and surrounded the postpetiole. Mandibles, head and the whole body smooth and shining. Head and body with sparse suberect hairs and dense decumbent pubescence. Scapes and tibiae with sparse subdecumbent hairs and dense decumbent pubescence. Body in color yellowish brown, legs brownish yellow.

Paratype worker: TL 4.0, HL 0.73, HW 0.57, CI 77, SL 0.67, SI 118, PW 0.43, AL 1.13, ML 0.47, PNL 0.33, PNH 0.43, PNW 0.30, PPNL 0.43, PPNH 0.43, PPNW 0.28 (1 individual measured). As holotype.

Holotype. worker, No. A00250, 2 250 m, Huatingsi Temple, Xishan Forest Park, Kun-

ming, Yunnan Province, 31 Mar. 2001, collected by XU Zheng-Hui in a soil sample in coniferous and broad-leaf mixed forest. Paratype: 1 worker, with same data as holotype.

This new species is close to *P. bicolor* Xu (Figs. 4-6), but differs in occipital margin straight, mandible thick and with 2 teeth on lateroventral margin, metanotal groove depressed, ventral margin of postpetiole concave, anterior margin of gaster deeply concave with anterolateral corners protruding and surrounded the postpetiole.

Key to Chinese species of *Leptanilla* based on worker caste

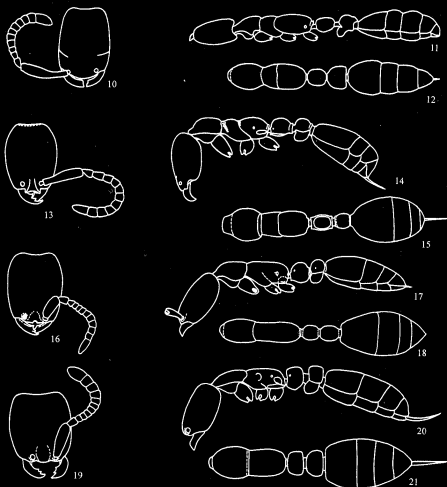
1. Metanotal groove present 2
Metanotal groove absent 3
2. In full face view head roughly rectangular. Clypeus not protruding with anterior margin roundly convex. In profile view dorsum of petiole almost straight. In dorsal view postpetiolar node much broader than petiolar node (Figs. 10-12) (China: Hunan Province) *L. hunanensis* Tang, Li et Chen
In full face view head distinctly narrowed forward. Clypeus protruding with anterior margin concave. In profile view dorsum of petiole roundly convex. In dorsal view postpetiolar node as broad as petiolar node (Figs. 13-15) (China: Middle Yunnan Province) *L. kunmingensis* sp. nov.
3. Anterior margin of clypeus straight and incised in the middle. In profile view petiolar node roundly convex, in dorsal view the node as broad as long (Figs. 16-18) (China: Taiwan Province) *L. taiwanensis* Ogata, Terayama et Masuko
Anterior margin of clypeus weakly convex and complete. In profile view petiolar node rectangular, in dorsal view the node broader than long (Figs. 19-21) (China: Southern Yunnan Province) *L. yunnanensis* Xu

Leptanilla kunmingensis sp. nov. (Figs. 19-21)

Holotype worker: TL 2.2, HL 0.47, HW 0.37, CI 79, SL 0.27, SI 73, PW 0.25, AL 0.63, ML 0.22, PNL 0.17, PNH 0.15, PNW 0.13, PPNL 0.13, PPNH 0.20, PPNW 0.13. Head longer than broad, distinctly narrowed forward. In full face view, occipital margin weakly concave, occipital corners bluntly prominent, lateral sides roundly convex. Mandible narrow and slender, masticatory margin with 3 teeth. Clypeus protruding forward and bicarinated, anterior margin evenly concave. Antenna short, with 12 segments, apex of scape reached to 2/3 of the distance from antennal socket to occipital corner, segments 4-10 about as broad as long, antennal club indistinct. In profile view, pronotum evenly convex, promesonotal suture distinct. Mesothorax constricted at its anterior portion, mesonotum convex. Metanotal groove depressed. Propodeum weakly convex, about 2 times as long as declivity, posterodorsal corner rounded. In profile view, dorsum of petiolar node roundly convex, anterior face short and sloped, dorsal and posterior faces formed a single arch. Subpetiolar process very narrow, weakly convex, anteroventral corner acutely angled. In profile view, postpetiolar node shorter than petiolar node, with dorsum roundly convex, the sternite formed a large broad subpostpetiolar process with blunt anteroventrally pointed corner. In dorsal view, petiolar node longer than broad, lateral sides weakly convex. Postpetiolar node nearly square, lateral sides evenly convex, as broad as petiolar node. Mandibles, head and the whole body smooth and shining. Head and body with dense decumbent pubescence. Petiole, postpetiole and gaster with sparse subdecumbent hairs. Scapes and tibiae with dense decumbent pubescence. Body in color brownish yellow.

Paratype workers: TL 2.1-2.2, HL 0.47-0.50, HW 0.37-0.40, CI 76-80, SL 0.23-0.30, SI 64-77, PW 0.25-0.27, AL 0.57-0.63, ML 0.20-0.23, PNL 0.15-0.17, PNH 0.13-0.15, PNW 0.12-0.13, PPNL 0.13, PPNH 0.18-0.22, PPNW 0.12-0.13 (8 individuals measured). As holotype.

Holotype worker, No. A00506, 2 150 m, Longmen, Xishan Forest Park, Kunming, Yunnan Province, 4 May 2001, collected by ZHAO Yu-Xiang in a soil sample in evergreen broad-leaf forest. Paratypes: 29 workers, with same data as holotype.

Figs. 10-21 *Leptanilla* workers

10-12. *L. hunanensis* Tang, Li et Chen 13-15. *L. kunmingensis* sp. nov. 16-18. *L. taiwanensis* Ogata, Terayama et Masuko 19-21. *L. yunnanensis* Xu 10, 13, 16, 19. head in full face view 11, 14, 17, 20. body in profile view 12, 15, 18, 21. body in dorsal view 10-12. after Tang et al. (1992) 16-18. after Ogata et al. (1995) 19-21. after Xu (2001)

This new species is close to *L. hunanensis* Tang, Li et Chen (Figs. 10-12), but clypeus protruding forward with anterior margin evenly concave, in profile view dorsum of petiole roundly convex, in dorsal view postpetiolar node as broad as petiolar node.

Acknowledgement We thank Mr. ZHAO Yu-Xiang (Postgraduate of Forest Protection Grade 2000, Southwest Forestry College, Kunming) for collecting the type specimens of *Leptanilla kunmingensis* sp. nov.

REFERENCES

- Baroni, Urbani C. 1977. Materiali per una revisione della sottofamiglia Leptanillinae Emery (Hymenoptera: Formicidae). *Ent. Basil.*, 2: 427-488.
- Bolton, B. 1990. The higher classification of the ant subfamily Leptanillinae (Hymenoptera: Formicidae). *Syst. Ent.*, 15: 267-282.

- Bolton, B. 1994. Identification guide to the ant genera of the world. Cambridge, Massachusetts, Harvard University Press. 1-222.
- Bolton, B. 1995. A new general catalogue of the ants of the world. Cambridge, Massachusetts, Harvard University Press. 1-504.
- Holldobler, B. and Wilson, E. O. 1990. The ants. Cambridge, Massachusetts, Harvard University Press. 1-732.
- Ogata, K., Terayama, M. and Masuko, K. 1995. The ant genus *Leptanilla*: discovery of the worker-associated male of *L. japonica*, and a description of a new species from Taiwan (Hymenoptera: Formicidae: Leptanillinae). *Syst. Ent.*, **20**: 27-34.
- Tang, J., Li, S and Chen, Y 1992. The discovery of Leptanillinae Emery (Hymenoptera: Formicidae) from China with description of a new species. *Acta Agr. Univ. Zhejiang*, **18**(1): 107-108.

中国云南细蚁亚科二新种

(膜翅目: 蚁科)

徐正会 张继玲

(西南林学院资源学院 云南昆明 650224)

摘 要

在云南省昆明市西山森林公园发现细蚁亚科 2 新种, 即叉颚原细蚁 *Protanilla furcomandibula* sp. nov. 和昆明细蚁 *Leptanilla kunmingensis* sp. nov. 分别编制了中国原细蚁属 *Protanilla* 3 个已知种和细蚁属 *Leptanilla* 4 个已知种工蚁分种检索表, 并附所有物种的插图。

关键词 膜翅目, 蚁科, 原细蚁属, 细蚁属, 新种.

中图分类号 Q969.554.2